

**FORAGE SUITABILITY GROUP**  
**LIMY UPLAND****FSG No.:** G055BY400ND**Major Land Resource Area:** 55B - Central Black Glaciated Plains**Physiographic Features**

The soils in this group are found on nearly level to strongly convex slopes on upland positions of glacial till moraines, plains, and valley sides.

	<u>Minimum</u>	<u>Maximum</u>
<b>Elevation (feet):</b>	980	1970
<b>Slope (percent):</b>	0	25
<b>Flooding:</b>		
<b>Frequency:</b>	None	None
<b>Duration:</b>	None	None
<b>Ponding:</b>		
<b>Depth (inches):</b>		
<b>Frequency:</b>	None	None
<b>Duration:</b>	None	None
<b>Runoff Class:</b>	Low	High

**Climatic Features**

This group occurs in a mid-continental climate characterized by wide seasonal temperature and precipitation fluctuations and extremes.

Annual precipitation varies widely from year to year in MLRA 55B. Average annual precipitation for all climate stations listed below is about 19 inches. About 78 percent of that occurs during the months of April through September. On average, there are about 28 days with greater than .1 inches of precipitation during the same time frame. Precipitation is lowest in the northwest and highest in the south in the MLRA.

Average annual snowfall ranges from 25 inches at Forman, North Dakota (ND), to 37 inches at Columbia, South Dakota (SD). Snow cover at depths greater than 1 inch range from 32 days at Petersburg, ND, to 98 days at Gackle, ND.

Average July temperatures are about 71<sup>0</sup>F and average January temperatures are about 7<sup>0</sup>F. Recorded temperature extremes in the MLRA during the years 1961 to 1990 are a low of -39 at both Petersburg and Oakes in ND, and a high of 114 recorded at Melleite, SD. The MLRA lies in USDA Plant Hardiness Zones 3b and 4a.

At Aberdeen, SD, the average annual wind speeds are about 11 mph. The highest wind speeds occur during March through May, but average monthly wind speeds do not vary significantly throughout the year. It is cloudy about 163 days a year. Average morning relative humidity in June is about 85 percent and average afternoon humidity is 60 percent.

The climate data listed in the tables below represent high and low ranges and averages for the climate stations and dates listed. For additional climate data, access the National Water and Climate Center at <http://www.wcc.nrcs.usda.gov>.

	<b>From</b>	<b>To</b>
<b>Freeze-free period (28 deg)(days):</b> (9 years in 10 at least)	115	137
<b>Last Killing Freeze in Spring (28 deg):</b> (1 year in 10 later than)	May 28	May 14
<b>Last Frost in Spring (32 deg):</b> (1 year in 10 later than)	Jun 06	May 23
<b>First Frost in Fall (32 deg):</b> (1 year in 10 earlier than)	Aug 29	Sep 10
<b>First Killing Freeze in Fall (28 deg):</b> (1 year in 10 earlier than)	Sep 08	Sep 21

	From	To
<b>Length of Growing Season (32 deg)(days):</b> (9 years in 10 at least)	92	116
<b>Growing Degree Days (40 deg):</b>	3389	4402
<b>Growing Degree Days (50 deg):</b>	1852	2558
<b>Annual Minimum Temperature:</b>	-35	-25
<b>Mean annual precipitation (inches):</b>	16	21

### Monthly precipitation (inches) and temperature (F):

<b>2 years in 10:</b>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
<b>Precip. Less Than</b>	0.24	0.13	0.30	0.63	1.08	1.72	1.30	0.94	0.76	0.23	0.18	0.24
<b>Precip. More Than</b>	0.60	0.79	2.10	3.58	4.09	5.07	3.66	4.02	3.07	1.92	1.14	0.74
<b>Monthly Average:</b>	0.50	0.43	1.02	1.89	2.41	3.39	2.65	2.27	1.94	1.18	0.57	0.46
<b>Temp. Min.</b>	-8.2	-2.7	11.6	28.1	39.9	50.0	54.0	51.2	40.8	30.3	15.0	-2.0
<b>Temp. Max.</b>	21.8	28.2	41.0	58.2	70.9	80.0	87.3	85.5	74.0	61.5	42.1	26.2
<b>Temp. Avg.</b>	7.4	13.6	26.9	42.8	55.7	65.4	71.0	68.7	57.6	45.8	28.3	12.9

<u>Climate Station</u>	<u>Location</u>	<u>From</u>	<u>To</u>
ND2482	Edgeley, ND	1961	1990
ND2605	Oaks, ND	1961	1987
ND2605	Ellendale, ND	1961	1987
ND2949	Fessenden, ND	1961	1990
ND3117	Forman, ND	1961	1990
ND3287	Fullerton, ND	1961	1990
ND3309	Gackle, ND	1961	1990
ND4343	Hurdsfield, ND	1961	1990
ND4413	Jamestown, ND	1961	1990
ND4937	La Moure, ND	1961	1990
ND5764	McVile, ND	1961	1990
ND7027	Petersburg, ND	1961	1990
ND8937	Valley City, ND	1961	1990
SD0020	Aberdeen, SD	1961	1990
SD1873	Columbia, SD	1961	1990
SD5456	Mellette, SD	1961	1990

### Soil Interpretations

This group consists of mostly well drained, medium textured soils formed in calcareous glacial till. Permeability is moderately slow to moderate.

<b>Drainage Class:</b>	Moderately well drained	To	Well drained
<b>Permeability Class:</b> (0 - 40 inches)	Moderately slow	To	Moderate
<b>Frost Action Class:</b>	Moderate	To	High

	<u>Minimum</u>	<u>Maximum</u>
<b>Depth:</b>	72	0
<b>Surface Fragments &gt;3" (% Cover):</b>	0	3
<b>Organic Matter (percent):</b> (surface layer)	1.0	6.0
<b>Electrical Conductivity (mmhos/cm):</b> (0 - 24 inches)	0	4
<b>Sodium Absorption Ratio:</b> (0 - 12 inches)	0	2
<b>Soil Reaction (1:1) Water (pH):</b> (0 - 12 inches)	7.4	8.4
<b>Available Water Capacity (inches):</b> (0 - 60 inches)	9	
<b>Calcium Carbonate Equivalent (percent):</b> (0 - 12 inches)	12	30

## Adapted Species List

The following forage species are considered adapted to grow on the soils in this group. Additional information concerning plant characteristics of a number of the listed species as well as individual cultivars of many of those species can be accessed on the web at <http://plants.usda.gov/>.

### Cool Season Grasses

Crested wheatgrass	G
Dahurian wildrye	F
Green needlegrass	F
Intermediate wheatgrass	F
Meadow bromegrass	F
Newhy Hybrid wheatgrass	G
Pubescent wheatgrass	F
Russian wildrye	F
Slender wheatgrass	F
Western wheatgrass	F

### Legumes

Alfalfa	F
American vetch	G
Hairy vetch	F
Purple Prairieclover	G
Sainfoin	F
Sweetclover	F
White prairieclover	F

### Warm Season Grasses

Big bluestem	F
Blue grama	G
Little bluestem	G
Prairie sandreed	F
Sideoats grama	G

G - Good adaptation for forage production on this group of soils in this MLRA

F - Fair adaptation but will not produce at its highest potential

## Production Estimates

Production estimates listed here should only be used for making general management recommendations. Onsite production information should always be used for making detailed planning and management recommendations.

The high forage production estimates listed below are based on dense, vigorous stands of climatically adapted, superior performing cultivars. They are properly fertilized for high yields and pest infestations are kept below economic thresholds. Mechanical harvests are managed to maintain stand life by cutting at appropriate stages of maturity and harvest intervals. If grazed, optimum beginning and ending grazing heights are adhered to. Adequate time is allowed for plant recovery before entering winter dormancy under both uses.

The production estimates listed below represent total annual above ground plant production on an air-dry-matter basis. Estimates of hay and grazing yields can be calculated from these numbers by multiplying them by a harvest efficiency. A 70 percent harvest efficiency is commonly used when converting to hay yields. Pasture harvest efficiency is highly dependent on the grazing management system applied, ranging from 25 to 50 percent.

### Forage Crop

### Management Intensity

	<u>High</u> (lbs/ac)	<u>Low</u> (lbs/ac)
Alfalfa/Crested wheatgrass	5100	2400
Alfalfa/Intermediate wheatgrass	5400	2700
Crested wheatgrass	4800	2400
Intermediate wheatgrass	5100	2500
Little bluestem	4700	2300

## Forage Growth Curves

Growth curves estimate the seasonal distribution of growth of the various forage crops. They indicate when the forages may be available for grazing or mechanical harvest.

**Growth Curve Number:** ND0001**Growth Curve Name:** Alfalfa**Growth Curve Description:** Alfalfa**Percent Production by Month**

<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
0	0	0	5	25	30	20	15	5	0	0	0

**Growth Curve Number:** ND0002**Growth Curve Name:** Cool season grass**Growth Curve Description:** Cool season grass**Percent Production by Month**

<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
0	0	0	5	40	35	10	5	5	0	0	0

**Growth Curve Number:** ND0003**Growth Curve Name:** Warm season grass**Growth Curve Description:** Warm season grass**Percent Production by Month**

<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
0	0	0	0	10	40	35	15	0	0	0	0

**Soil Limitations**

The primary limitation to the soils in this group is the high lime content close to the soil surface. The lime reduces the availability of some plant nutrients. This reduces species choices and yield potential. Also, because most of these are sloping soils on ridges and knobs, they are subject to water and wind erosion, especially when establishing or renovating stands. They also tend to be droughty.

**Management Interpretations**

The impact on yields can be reduced by selecting forage species that are tolerant of the high lime levels inherent to these soils. Including sod forming grass species in stands, especially on steeper slopes will reduce the potential for sheet and rill erosion. Incorporate both wind and water erosion control practices during the establishment period. Properly locating facilitating practices such as fences, lanes, and water developments can help control livestock movement, reduce trailing perpendicular to steeper slopes, and evenly distribute grazing pressure.

Pasture and hayland can include considerations for wildlife. Delaying grazing on portions of the pasture or rotating pastures will allow nest initiation of grassland nesting birds or species of concern. Nest initiation of most grassland nesting birds occurs from April 15 to June 1. Delaying haying until after July 15 allows for most species to fledge their young. Consider planting species with later maturity to allow for harvesting after nests have fledged. Avoid mowing around the field. Mow back and forth or from the inside to the outside of the field. Consider using flushing bars on swathers and mowers.

**FSG Documentation****Similar FSGs:**

<u>FSG ID</u>	<u>FSG Narrative</u>
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G055BY100ND	Loamy soils do not have as high a lime content near the surface and are more productive.
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**Inventory Data References**

Agriculture Handbook 296-Land Resource Regions and Major Land Resource Areas

Natural Resources Conservation Service (NRCS) National Water and Climate Center data

USDA Plant Hardiness Zone maps

National Soil Survey Information System (NASIS) for soil surveys in North Dakota and South Dakota counties in MLRA 55B

North Dakota NRCS Field Office Technical Guide

NRCS South Dakota Technical Guide

NRCS National Range and Pasture Handbook

Various Agricultural Research Service, Cooperative Extension Service, and NRCS research trials for plant adaptation and production.

### State Correlation

This site has been correlated with the following states: North Dakota and South Dakota

### Forage Suitability Group Approval:

Original Author: Tim Nordquist

Original Date: 1/4/01

Approval by: Jeff Printz

Approval Date: